

The Barbie Bungee Jump

Objective: To create a mathematical model or equation relating the distance Barbie will fall to the number of rubber bands making up a bungee cord. You will then use your model to predict the number of rubber bands needed to perform the bungee jump from a specific height.



Procedure: You will need a Barbie, a supply of rubber bands, and a meter stick or measuring tape. (Because Ken is built differently, he does not fall in the same way as Barbie but, with adjustments, Ken can be used as well.)

Part 1: Attach a rubber band to Barbie's feet. Then make a bungee cord by attaching more rubber bands to the first one. Next, stand Barbie on the edge of a table, holding the end of the cord there as well. Let Barbie fall, head first. Use your measuring device to measure the distance she falls. Repeat the fall several times until you have an average or typical value for the distance. Add bands and record the distance fallen in a table such as the one shown below.



# of rubber bands	2	3	4	7
Distance fallen					

Part 2: Plot the information from your table on a graph. Find a pattern that allows you to determine the distance Barbie will fall for *any* number of rubber bands. You must be able to explain your reasoning.

Part 3: A location for the final bungee jump will be specified. Use your pattern to determine the number of rubber bands to give Barbie the thrill of her little plastic life. This means that she should come as close as possible to the ground without hitting her head. When you have determined the number of rubber bands, make this bungee cord and get ready.

Part 4: Write up the entire experiment. Include the following in your report:

1. a description of how you collected your data.
2. data table
3. graph of your data
4. clear description of your pattern (or a best fit equation) and how you found it
5. your calculations for Barbie's final jump
6. description of what happened in the final jump
7. conclusions: what problems did you encounter? What worked well? If you were to repeat the whole thing, what you do differently? How would you improve this investigation?

There are many Web sites and descriptions of this e.g.,
<http://www.ma.iup.edu/projects/SEQual/newsletters/Number17March2000.pdf> (Go to page 4-6)